

Claims

1. A valve opening/closing timing controlling apparatus,
5 comprising:

a housing member rotatable together with a drive member for transmitting a drive force;

a rotor member rotatably assembled with the housing member, a vane portion of the rotor member forming, within said housing member, a phase-advanced oil chamber and a phase-lagged oil chamber, the rotor
10 member being rotatable together with a cam shaft;

a torsion coil spring for urging the rotor member relative to the housing member in a phase advancing direction; and

a hydraulic circuit for controlling feeding/discharging of work oil to
15 or from said phase-advanced oil chamber or said phase-lagged oil chamber;

wherein said torsion coil spring has one end thereof fixed to said housing member and the other end thereof fixed to a projection provided on said rotor member.

20 2. The valve opening/closing timing controlling apparatus according to claim 1, the other end of the torsion coil spring is retained in a retaining groove defined in said projection of the rotor member.

3. The valve opening/closing timing controlling apparatus
25 according to claim 2, wherein the other end of the torsion coil spring is clamped between the retaining groove provided in the rotor member and a positioning pin inserted in the retaining groove for positioning the rotor member relative to the cam shaft.

30 4. A valve opening/closing timing controlling apparatus

comprising:

a housing member rotatable together with a drive member;

a rotor member rotatably assembled with the housing member, a
vane portion of the rotor member forming, within said housing member, a
5 phase-advanced oil chamber and a phase-lagged oil chamber, the rotor
member being rotatable together with a cam shaft;

a torsion coil spring for urging the rotor member relative to the
housing member in a phase advancing direction; and

a hydraulic circuit for controlling feeding/discharging of work oil to
10 or from said phase-advanced oil chamber or said phase-lagged oil chamber;

wherein said torsion coil spring has one end thereof fixed to said
housing member and the other end thereof fixed to a recessed portion
formed concave in a retaining groove formed in said rotor member.

15 5. The valve opening/closing timing controlling apparatus
according to claim 4, wherein the other end of the torsion coil spring is
clamped between the retaining groove and a positioning pin for positioning
the rotor member relative to the cam shaft.